

# Distributed GIS Computing for High Performance Simulation and Visualization, Phase I

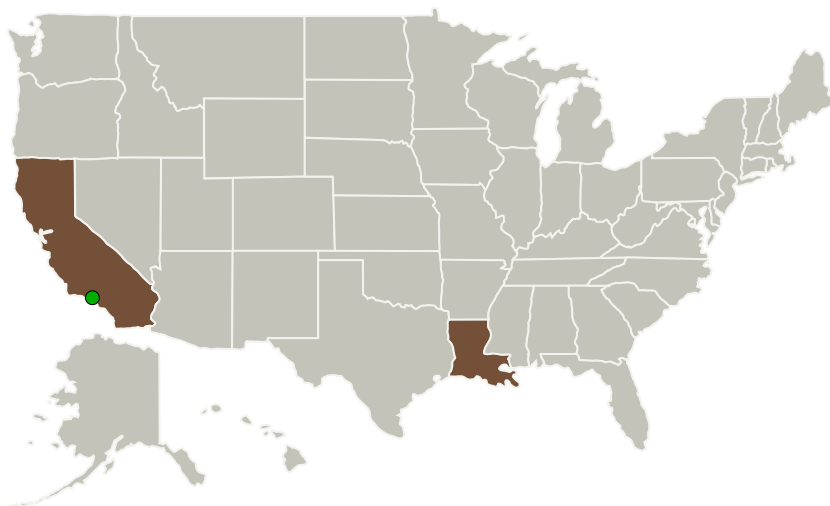
Completed Technology Project (2011 - 2011)



## Project Introduction

Today, the ability of sensors to generate geographical data is virtually limitless. Although NASA now provides (together with other agencies such as the USGS) a capability for accessing, manipulating, and visualizing these data, an enormous gap still exists between the sensor data and the visualization capability, largely due to the rapid technological advances with respect to desktop visualization of large datasets. The challenge addressed in this research is to develop new methods for automating the access and processing of raw sensor data, sharing data and methods among researchers, and integrating visualization throughout the process. To meet this challenge, we will develop two new innovations: Geo-Cloud and COAST HPGIS. Geo-Cloud is the distributed network environment that maintains connectivity between a geo-browser and Geo-Resources (sensor data, GIS datasets, models, simulations, and metadata). The Geo-Cloud maintains all metadata (and ontology) required to efficiently catalog, locate, store, access, and update Geo-Resources. The significance of the Geo-Cloud creation is that it is a highly performing, scalable, network environment that encompasses: 1) a high performance cloud computing (HPCC) environment, and 2) geographical context (HPGIS) whereby users can store, access, and manipulate extensive geographical resources. The Geo-Cloud provides virtualized access to Internet2 and supercomputing resources for processing very large datasets and simulations. COAST HPGIS is an enhanced version of the NASA COAST product which is based on the NASA World Wind geo-browser. COAST HPGIS includes plug-ins, overlays, and interfaces for COAST in order to enable interaction with the Geo-Cloud for real-time visualization of temporal and parametric simulations and models.

## Primary U.S. Work Locations and Key Partners



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## Table of Contents

Project Introduction	1
Primary U.S. Work Locations and Key Partners	1
Project Transitions	2
Organizational Responsibility	2
Project Management	2
Technology Maturity (TRL)	2
Technology Areas	3
Target Destinations	3

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Organizations Performing Work	Role	Type	Location
DQSI, LLC	Lead Organization	Industry Small Disadvantaged Business (SDB), Women-Owned Small Business (WOSB)	Covington, Louisiana
● Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

## Primary U.S. Work Locations

California	Louisiana
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## Project Transitions

▶ **February 2011:** Project Start

✓ **September 2011:** Closed out

## Closeout Documentation:

- Final Summary Chart(<https://techport.nasa.gov/file/138103>)

## Organizational Responsibility

**Responsible Mission Directorate:**

Space Technology Mission Directorate (STMD)

**Lead Organization:**

DQSI, LLC

**Responsible Program:**

Small Business Innovation Research/Small Business Tech Transfer

## Project Management

**Program Director:**

Jason L Kessler

**Program Manager:**

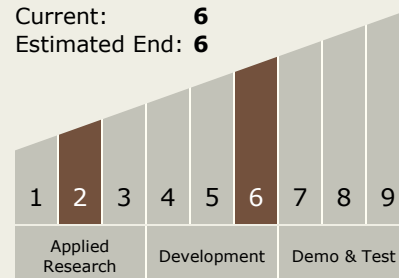
Carlos Torrez

**Principal Investigator:**

Shelly S Stubbs

## Technology Maturity (TRL)

Start: 2  
Current: 6  
Estimated End: 6



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## Technology Areas

### Primary:

- TX11 Software, Modeling, Simulation, and Information Processing
  - └ TX11.6 Ground Computing
    - └ TX11.6.8 Cloud Computing

## Target Destinations

The Sun, Earth, The Moon, Mars, Others Inside the Solar System, Outside the Solar System